

FIG. 1A

Layer #	Layer Material	Layer Doping Type	Typical Doping (atoms/cm <sup>3</sup> )	Typical Layer Thickness (Å)	Layer #
30	InGaAs	P+	1E20	25	165b
	GaAs	P+	1E20	75	165a
28	Al(.7)Ga(.3)As	P	1E17	700	164b
	Al(.7)Ga(.3)As	P+	1E19	10	164a
	Al(.15)Ga(.85)As	P+	3.5E18	25	163d
26	Al(.15)Ga(.85)As		UD	300	163c
	Al(.15)Ga(.85)As	N+	3.5E18	80	163b
	Al(.15)Ga(.85)As		UD	30	163a
24	GaAs		UD	15	162
	In(.20)Ga(.80)AsN } x3		UD	60	161
	QW/GaAs QW } x3				
	GaAs Barrier				
22	GaAs		UD	100	160b
	Al(.15)Ga(.85)As		UD	150	160a
	GaAs Barrier		UD	5000	159
20	In(.20)Ga(.80)AsN } x3		UD	100	158
	QW/GaAs QW } x3		UD	60	157
	GaAs		UD	15	156
	Al(.15)Ga(.85)As		UD	30	155d
18	Al(.15)Ga(.85)As	P+	3.5E18	80	155c
	Al(.15)Ga(.85)As		UD	300	155b
16	Al(.15)Ga(.85)As	N+	3.5E18	80	155a
	Al(.15)Ga(.85)As	N	1E17	700	154
14	Al(.7)Ga(.3)As	N+	3.5E18	2200	153
	GaAs		UD	1701	151
12	AlAs		UD	696	152
	GaAs } x7		UD	1701	151
	AlAs }		UD		
10	GaAs Substrate		SI		149

FIG. 1B

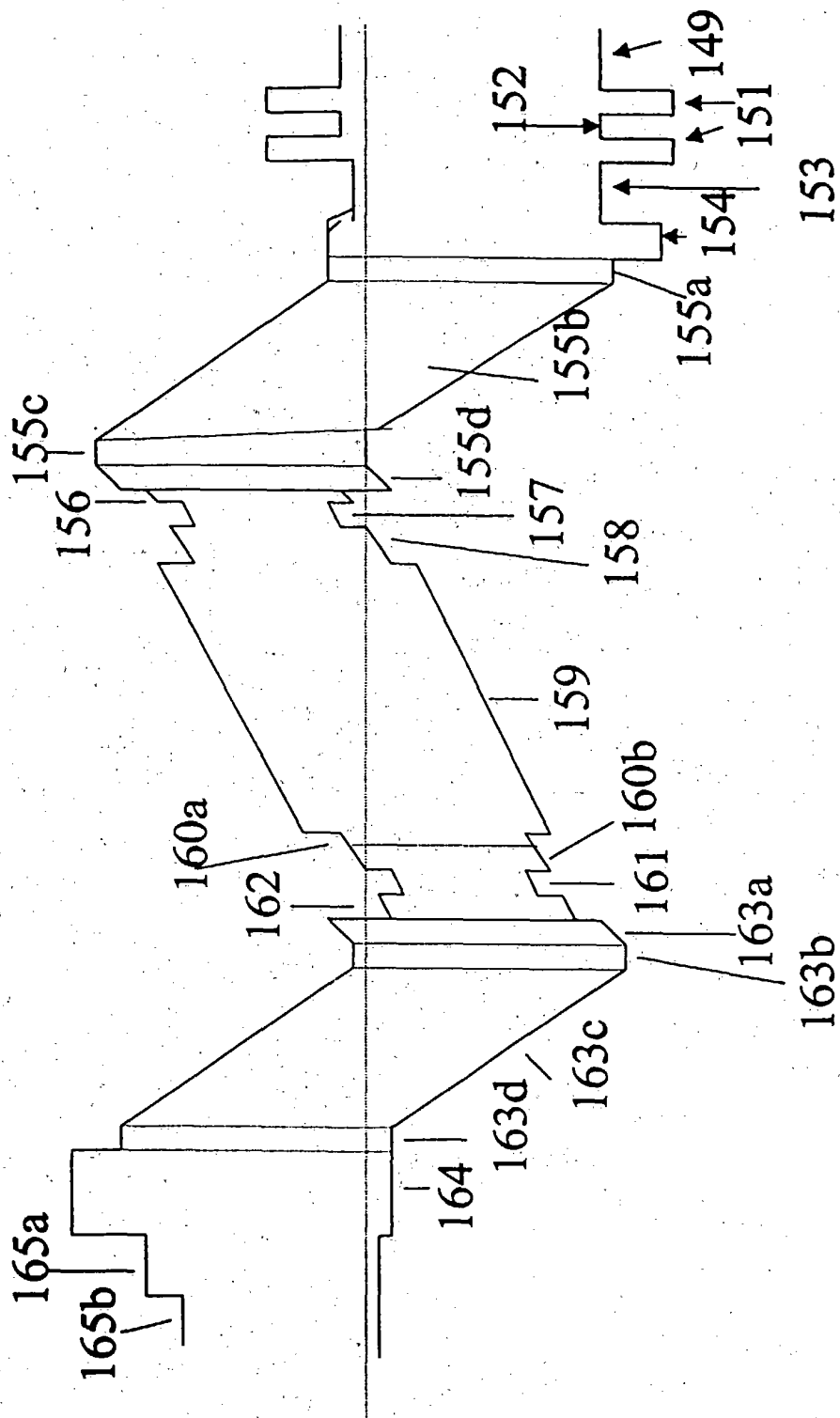


FIG. 1C

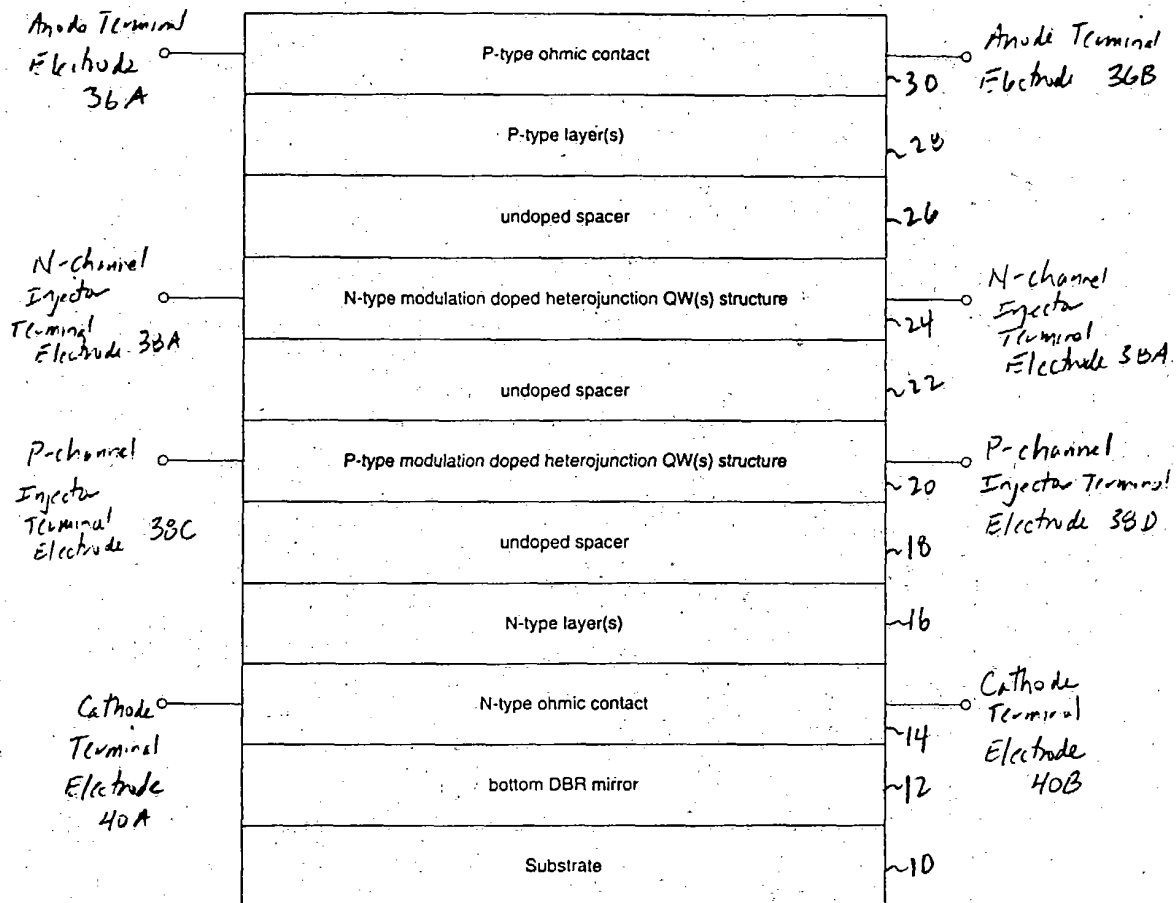
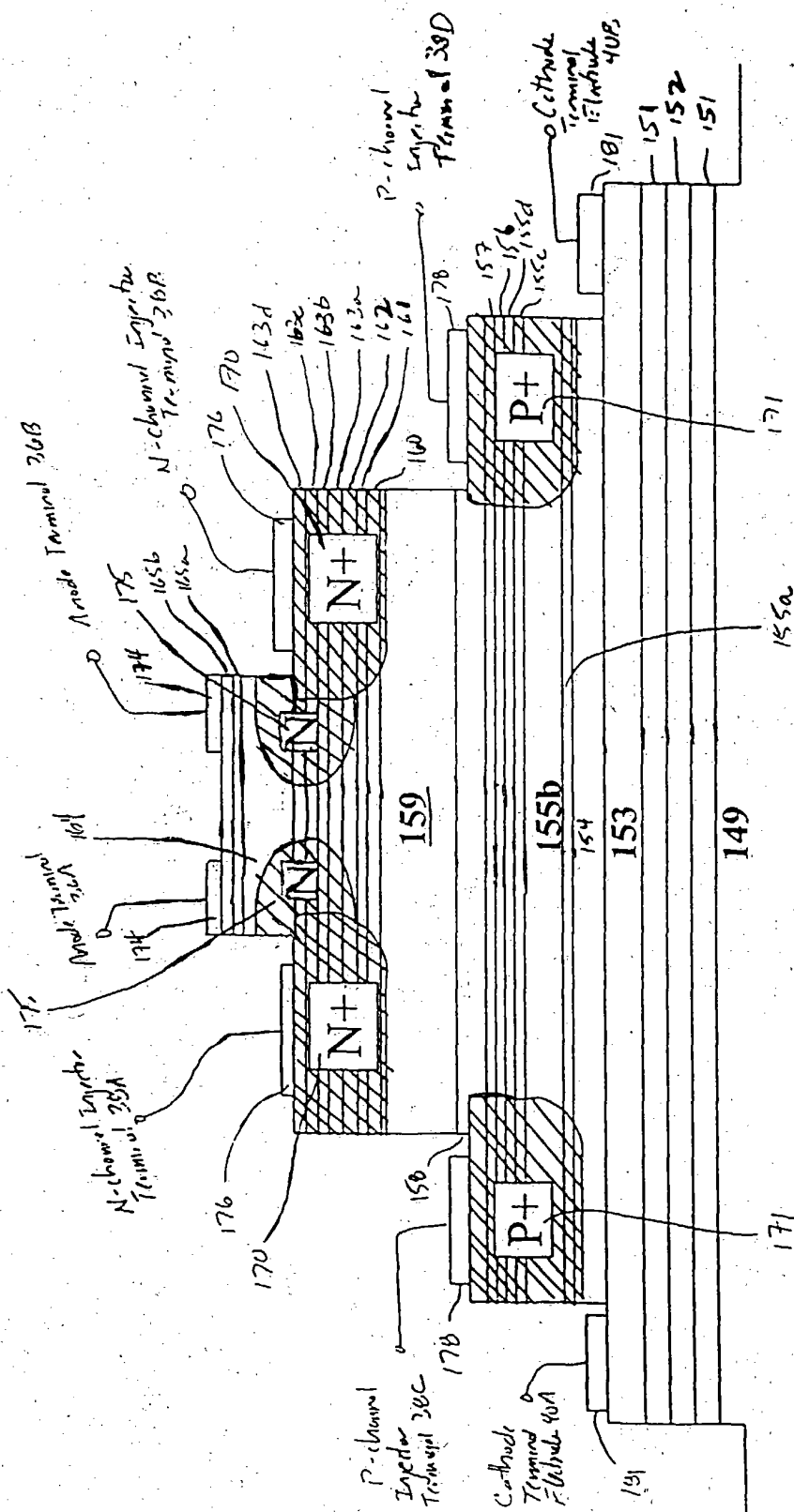


FIG. 2A



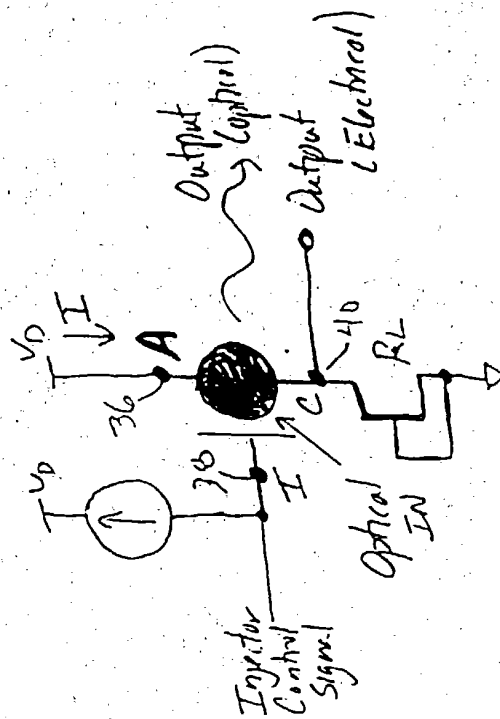


FIG 2C

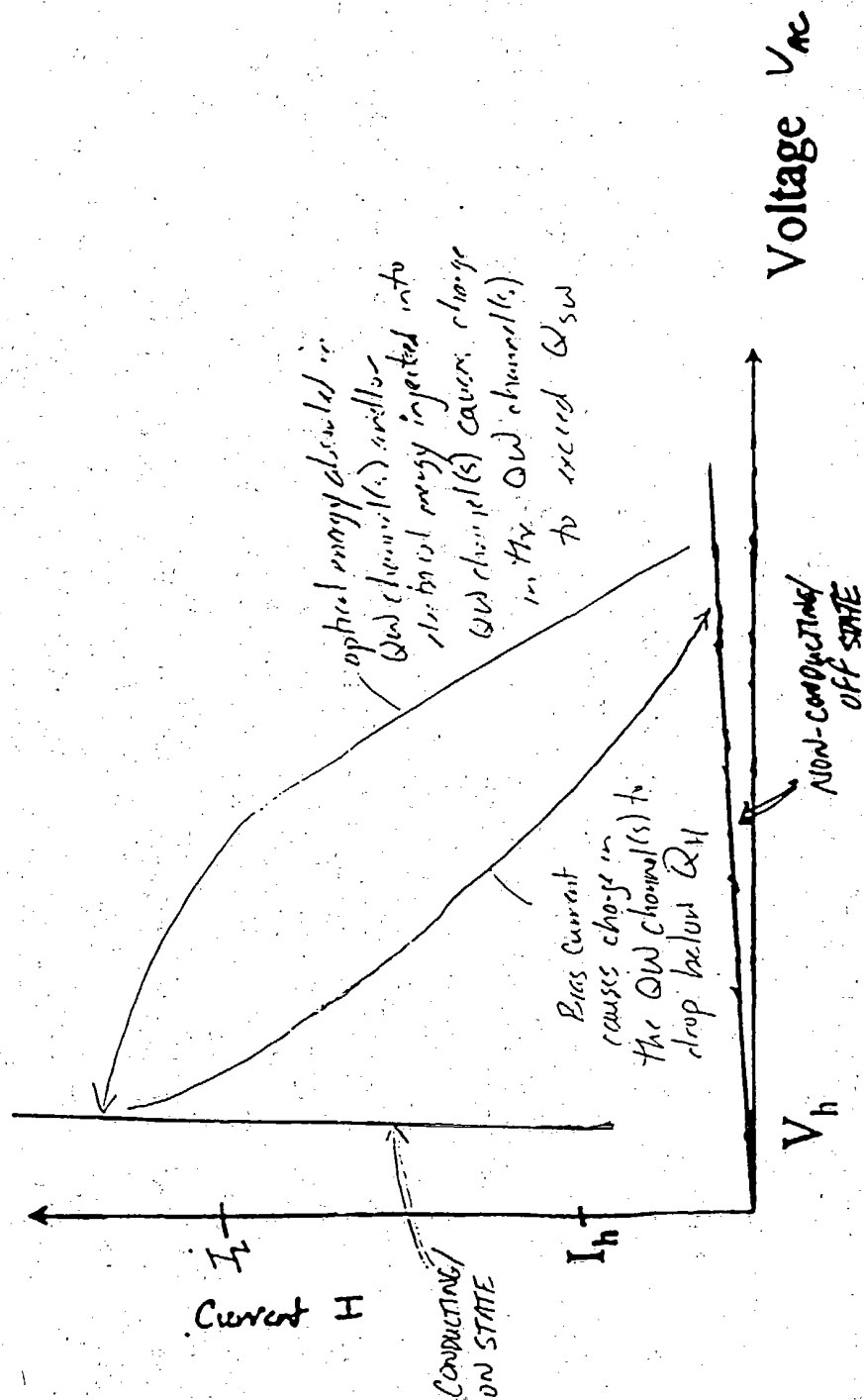


FIG. 2D

FIG. 3A1

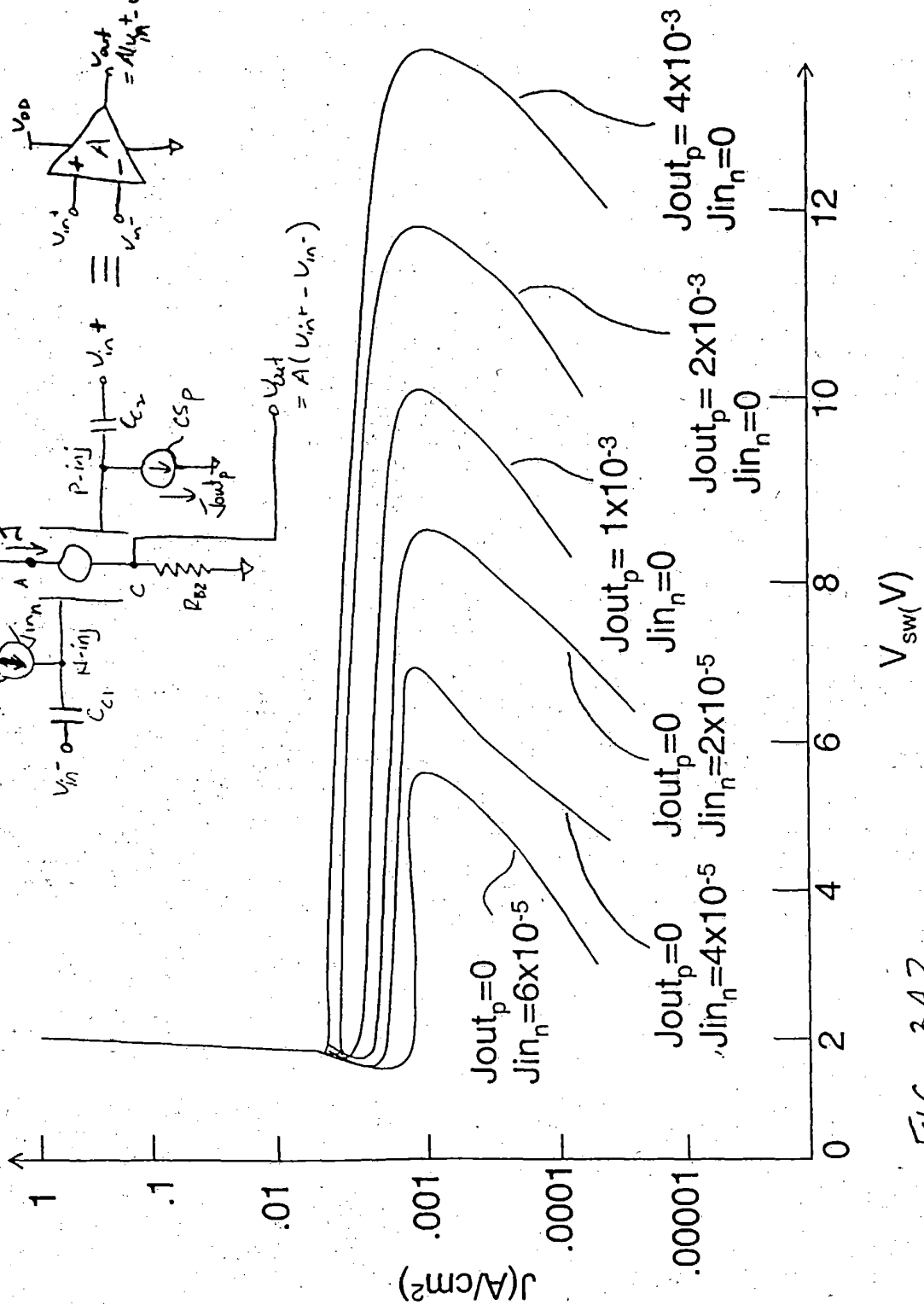
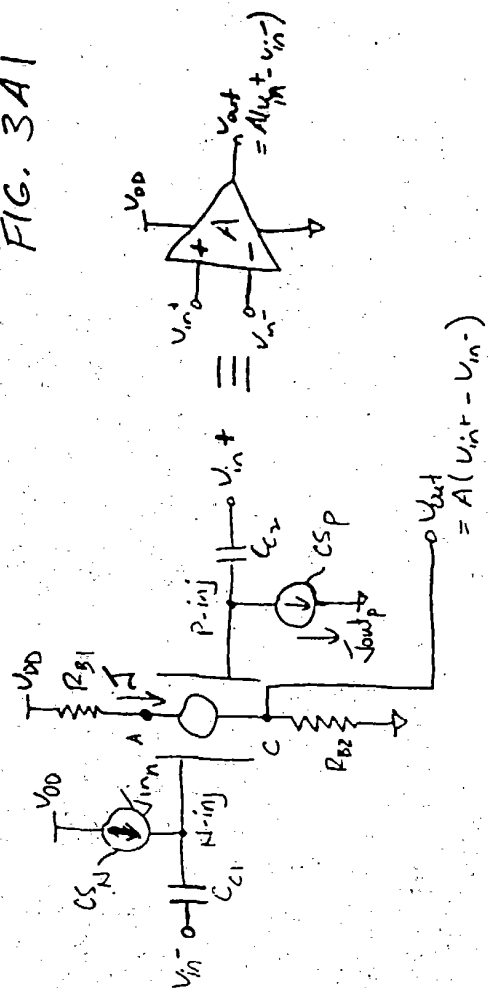


FIG. 3A2



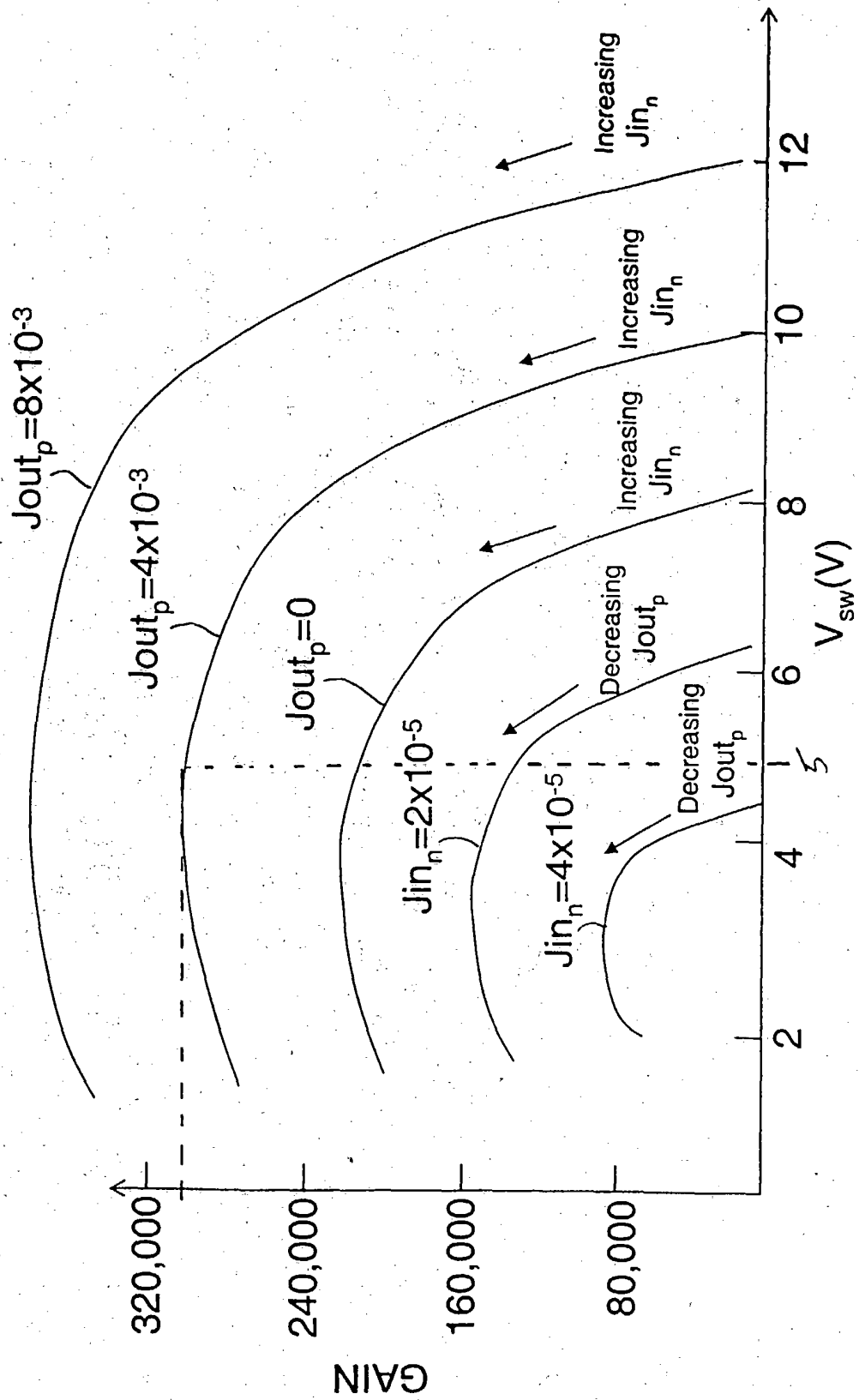


FIG. 3A3

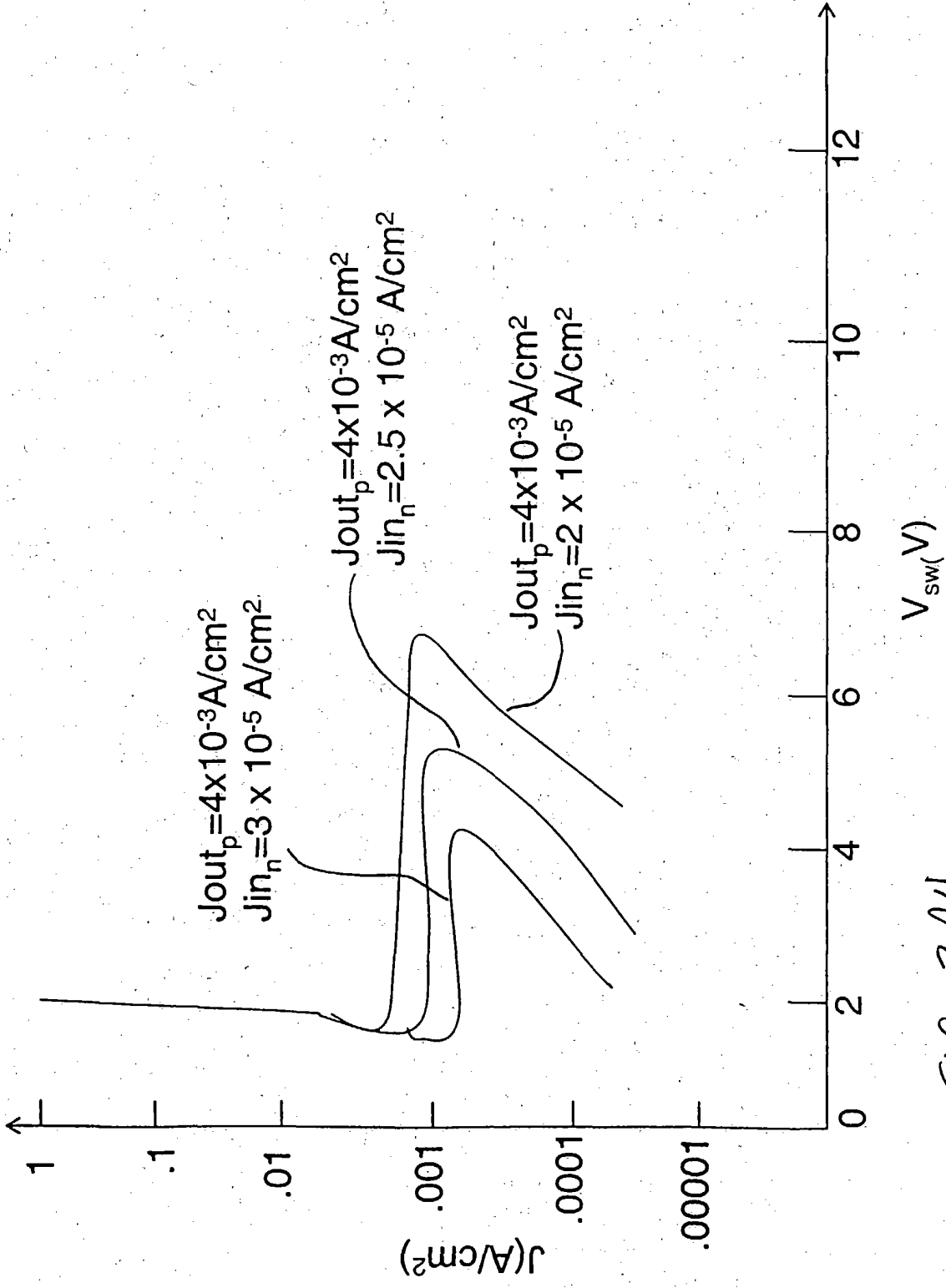
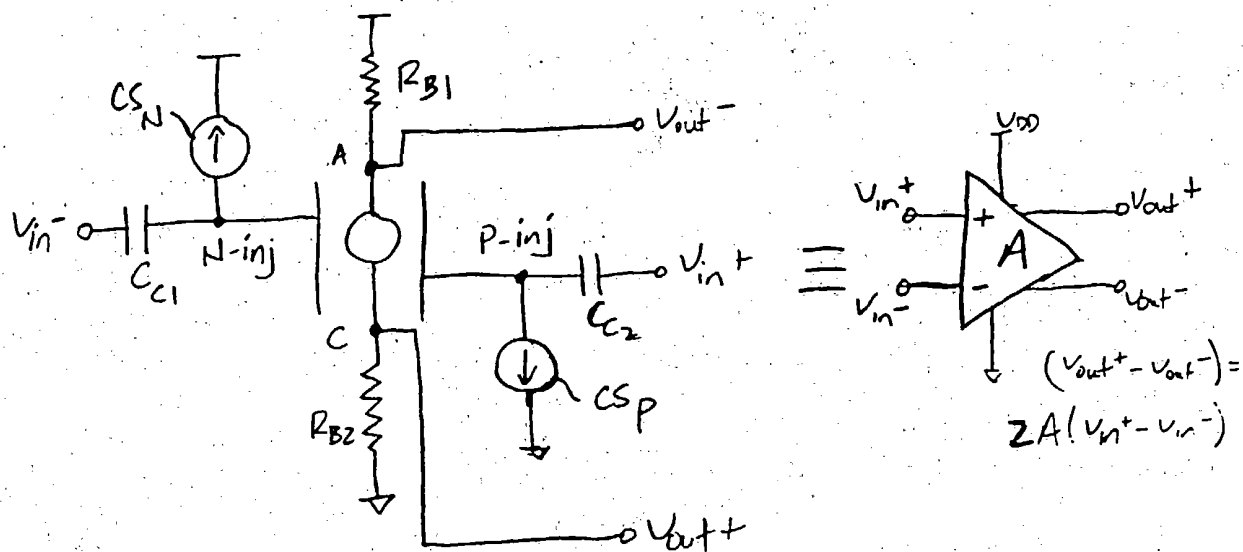


FIG. 3A4



$$(V_{out+} - V_{out-}) = 2A(V_{in+} - V_{in-})$$

FIG. 3A5

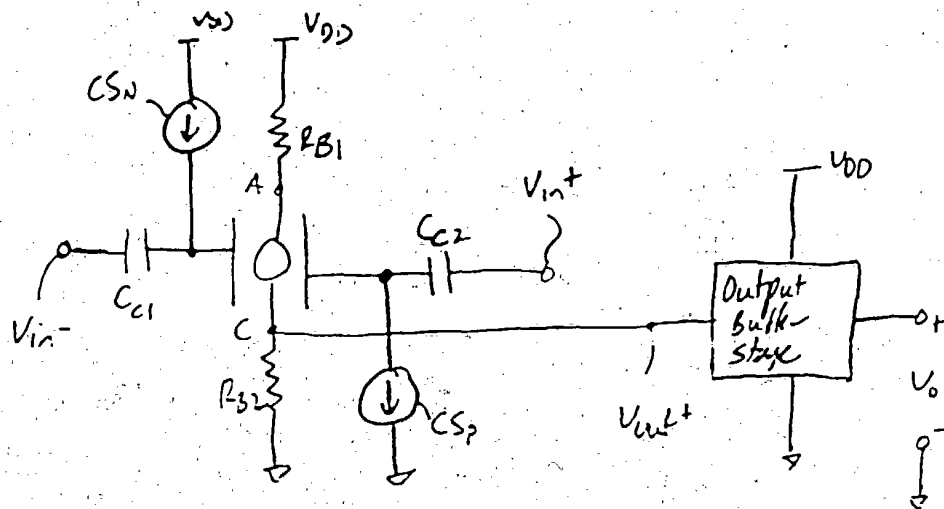
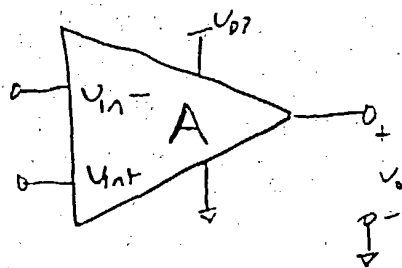


FIG. 3A6 where  $V_0 \approx -A(V_{int+} - V_{in-})$



where  $V_0 \approx -A(V_{int+} - V_{in-})$

FIG. 3A7

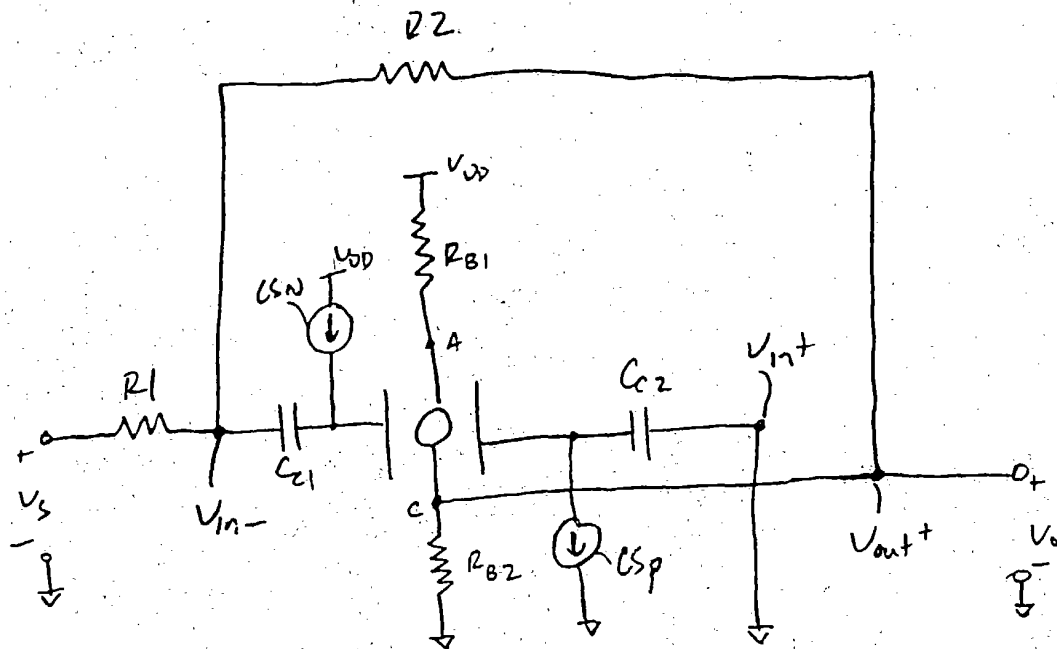


FIG 4A1

where  $V_o \approx -\frac{R_2}{R_1} V_s$

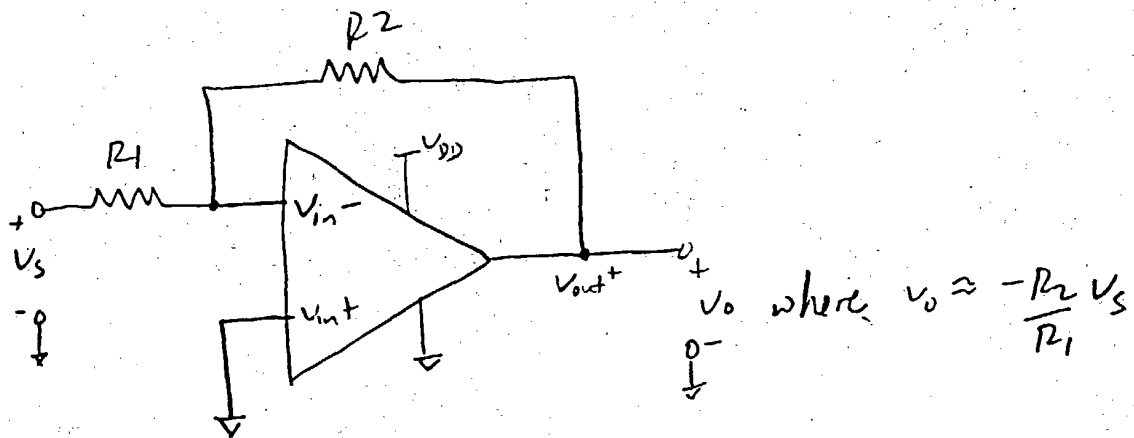


FIG 4A2

where  $V_o \approx -\frac{R_2}{R_1} V_s$

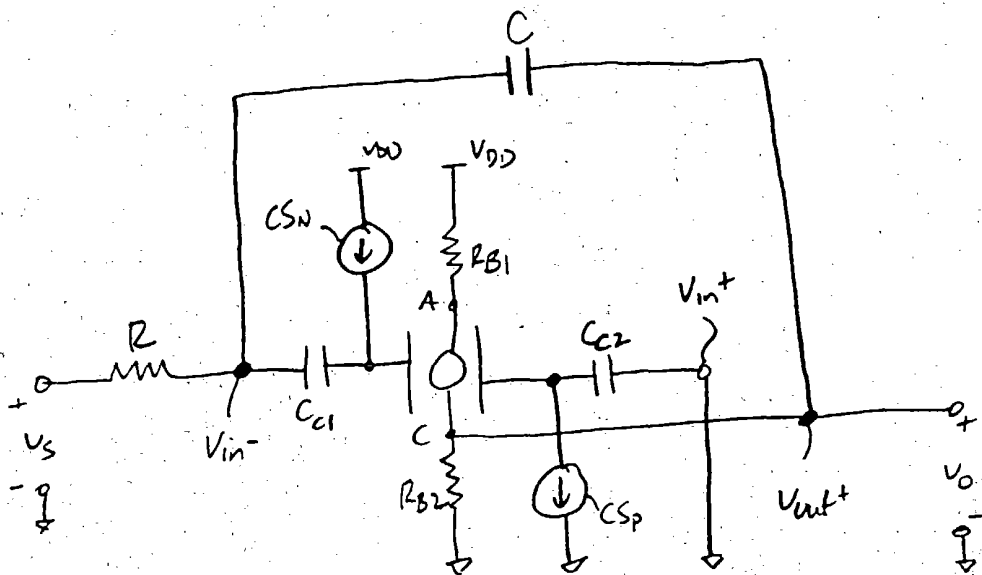


FIG. 4B1

where  $v_o(t) \approx \frac{-1}{RC} \int v_s(t) dt$

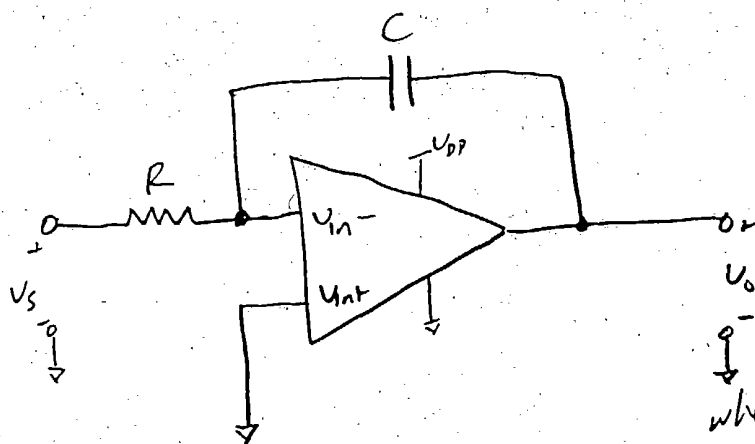


FIG. 4B2

where  $v_o(t) \approx \frac{-1}{RC} \int v_s(t) dt$